

has sometimes so slowly increased, that I have observed the Bubble to be some hours in passing between the top and bottom.

7. Whether the appearance of the *Pike of Tenerif*, and several other high Mountains, at so much greater a distance then seems to agree with their respective heights, be not to be attributed to the *Curvature* of the visual Ray, that is made by its passing obliquely through so differing *Dense* a Medium from the top to the eye very far distant in the Horizon: For since we have already, I hope, made it very probable, that there is such an *inflection* of the Rays by the differing density of the parts of the Air; and since I have found, by several Experiments made on places comparatively not very high, and have yet found the pressure sustain'd by those parts of the Air at the top and bottom, and also their differing Expansions very considerable: Insomuch that I have found the pressure of the *Atmosphere* lighter at the top of *St. Paul's Steeple* in *London* (which is about two hundred foot high) then at the bottom by a sixtieth or fiftieth part, and the expansion at the top greater then that at the bottom by neer about so much also; for the *Mercurial Cylinder* at the bottom was about 39. inches, and at the top half an inch lower; the Air also included in the Weather-glass, that at the bottom fill'd only 155. spaces, at the top fill'd 158. though the heat at the top and bottom was found exactly the same with a scal'd *Thermometer*: I think it very rational to suppose, that the greatest *Curvature* of the Rays is made nearest the Earth, and that the inflection of the Rays, above 3. or 4. miles upwards, is very inconsiderable, and therefore that by this means such calculations of the height of Mountains, as are made from the distance they are visible in the Horizon, from the supposal that that Ray is a straight Line (that from the top of the Mountain is, as 'twere, a Tangent to the Horizon whence it is seen) which really is a *Curve*, is very erroneous. Whence, I suppose, proceeds the reason of the exceedingly differing Opinions and Assertions of several Authors, about the height of several very high Hills.

8. Whether this Inflection of the Air will not very much alter the supposed distances of the Planets, which seem to have a very great dependence upon the Hypothetical refraction or inflection of the Air, and that refraction upon the hypothetical height and density of the Air: For since (as I hope) I have here shewn the Air to be quite otherwise then has been hitherto suppos'd, by manifesting it to be, both of a vast, at least an uncertain, height, and of an unconstant and irregular density; It must necessarily follow, that its inflection must be varied accordingly: And therefore we may hence learn, upon what sure grounds all the Astronomers hitherto have built, who have calculated the distance of the Planets from their Horizontal *Parallax*; for since the Refraction and *Parallax* are so nearly ally'd, that the one cannot be known without the other, especially by any wayes that have been yet attempted, how uncertain must the *Parallax* be, when the Refraction is unknown? And how easie is it for Astronomers to assign what distance they please to the Planets, and defend them, when they have such a curious *subterfuge* as that of Refraction, wherein a very little variation will allow them liberty enough to place the Celestial Bodies at what distance they please.

If therefore we would come to any certainty in this other wayes to work; and as I have here examined the active property of the Air by other wayes then are, find the *Parallax* of the Planets by wayes not yet practis'd, I cannot imagine any better way, then the Observing two persons at very far distant parts of the Earth, that be under the same Meridian, or Degree of longitude, much in latitude, as there can be places conveniently for persons, at certain appointed times, should (as near as may be) at the same time, observe the way of the *Moon*, *Mars*, and *Saturn*, amongst the fixt Stars, with a good large looking little Iconismes, or pictures, of the small fixed Stars, each of them to lye in or near the way of the Center of the exact measure of the apparent Diameter; from such Observations together, we might certainly know the *Parallax*, of the Planet. And having any one true Planet, we might very easily have the other by their positions, which the *Telescope* likewise affords us very accurately, their motions might be much better known, and their motions more exactly regulated. And for this purpose I know not any more convenient for such an Observation to be made in, then *St. Helena*, upon the Coast of *Africk*, which lyes about to the Southwards of the Line, and is very near, according to Geographical Maps, in the same Meridian with *London*; they may not perhaps lye exactly in the same, yet they being ordered according to what I shall anon shew, it will be easy to find the true distance of the Planet. But were they under the same Meridian, it would be much better.

And because Observations may be much easier, and made with good *Telescopes*, then with any other Instruments, I suppose, seem impertinent to explain a little what way is most fit and convenient for that particular. Such therefore Observers for this purpose, should be furnished with Instruments that can be had, the longer the better and more exact. These should be fitted with a *Rete*, or divided Scale, placed at a distance within the Eye-glass, that they may be distinctly seen, and be the measures of minutes and seconds; by this Instrument the Observer should, at certain prefixt times, observe the Planet, in, or very near, the Meridian; and because it will be difficult to find two convenient stations that will happen to be under the same Meridian, they shall, each of them, observe the Planet both for an hour before, and an hour after, it arrives at the Meridian, and by a line, or stroke, amongst the small fixed Stars, mark out the way that each of them observ'd the Center of the Planet mov'd in for those two hours: These Observations may be repeated for many dayes together, that both it may hap-